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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/824,750	04/15/2004	Chao -Hsiung Wang	TSMC2003-1412(NI280-00280	7047

54657 7590 10/25/2007  
DUANE MORRIS LLP  
IP DEPARTMENT (TSMC)  
30 SOUTH 17TH STREET  
PHILADELPHIA, PA 19103-4196

EXAMINER

NGUYEN, HUNG

ART UNIT	PAPER NUMBER
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2851

MAIL DATE	DELIVERY MODE
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10/25/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/824,750

Applicant(s)

WANG ET AL.

Examiner

Hung Henry V. Nguyen

Art Unit

2851

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 11-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 11-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 4/15/04 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 13, 2007 has been entered.

### ***Drawings***

2. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

Art Unit: 2851

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, 8-9, 11-15, 20-29 and 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amblard et al (U.S.Pat. 7,056,646).

With respect to claims 1-3, 8-15, 20-29 and 31-33, Amblard et al disclose a photolithography system and corresponding method comprising: at least one lens (14) for transmitting a predetermined radiation on a predetermined substrate (10) and a fluid volume (18) in contact with the lens on its first end and with the substrate on its second ends.

As to claims 2-3 and 28, Amblard et al further teach a radiation source for providing an electromagnetic radiation with a wavelength of about 193 nm or less or a wavelength of 157nm or less (see col.6, lines 15-19).

As to claims 8, 9, 20, and 25-27, Amblard et al further disclose the fluid volume (18) including water or metal hydroxide, or de-ionized water, or the fluid volume including NaOH in an aqueous solution, or CaOH in an aqueous solution, or KOH in an aqueous solution (see col. 3, lines 7-52).

As to claims 13-14, 23-24, and 33, Amblard et al furthermore teach the substrate having a radiation sensitive material/or photo resist material (20, 34) formed thereon.

Thus, Amblard et al disclose substantially all of the limitations of the instant claims of the present application. Amblard et al do not expressly disclose the specific ranges of the fluid volume as recited in the instant claims. For instance: "the fluid volume has a molar concentration of hydroxyl ions between about  $10^{-7}$  mole per liter and about  $10^{-3}$  mole per liter" or "the molar concentration of hydroxyl ions between about  $10^{-3}$  mole per liter and about  $10^{-5}$  mole per liter" or "the molar concentration of hydroxyl ions between about  $10^{-5}$  mole per liter

Art Unit: 2851

and about  $10^{-7}$  mole per liter". However, this feature does not provide any inventive steps and it is known in the art. For example, Amblard et al teach that the fluid volume with a pH greater than 8 or greater than 9, or greater than about 10 (see col.4, lines 19-24). This is a concrete evidence that it would have been obvious to a skilled artisan to utilize a fluid volume having a molar concentration of hydroxyl ions in the specified ranges as recited in the instant claims in order to obtain the fluid volume having the pH greater than 8, 9 or 10 as intended by Amblard et al. The at least purpose of doing so would have been to keep the projection lens clean (see col.3, lines 1-6 of Amblard et al) and thereby improving the quality of the immersion lithography system. Also, it is noted that it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

5. Claims 6-7, 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amblard et al (U.S.Pat. 7,056,646) in view of Loopstra et al (US 2005/0094119 A1).

With respect to claims 6-7 and 18-19, Amblard et al discloses substantially all of the limitations of the instant claims as discussed except for the lens being made of silicon oxide or calcium fluoride. Loopstra et al disclose an immersion lithography system having a projection lens made of silicon oxide or calcium fluoride (see paragraph [0015]). In view of such teachings, it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ a silicon oxide lens or a calcium fluoride lens into the lithography system of Amblard et al for the purpose of improving the optical performance of the projection lens thereby increasing the quality of the printed images.

Art Unit: 2851

6. Claims 4-5, 16-17 and 30 are rejected under 35 U.S.C. 103(a) as being Amblard et al (U.S.Pat. 7,056,646) in view of Schuster (U.S.Pat. 7,092,069).

With respect to claims 4-5, 16-17 and 30, Amblard et al disclose substantially all of the limitations of the instant claims as described above. Amblard et al do not specifically disclose the lens having a numerical aperture size between about 0.75 and about 0.85 or between about 0.85 and 1.05. However, these features are well known in the art. Schuster discloses an immersion lithography system having a projection lens with very high numerical apertures in the regions of  $NA > 0.80$  or more (see abstract). In view of such teachings, it would have been obvious to combine the teachings of Amblard et al and Schuster to obtain the invention as specified in claims 4-5, 16-17 and 30 of the present application. It would have been obvious to a skilled artisan to use a projection lens having a numerical aperture size in the specific ranges as recited in the mentioned claims for improving the resolution of the printed images.

***Response to Amendment/Arguments***

7. Applicant's amendment filed 7/9/2007 have been entered. Applicant's arguments with respect to prior art rejections have been carefully reviewed but have been traversed in view of new grounds of rejections as set forth above.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Henry V. Nguyen whose telephone number is 571-272-2124. The examiner can normally be reached on Monday-Friday (First Friday off).

Art Unit: 2851

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diane Lee can be reached on 571-272-2399. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



**Hung Henry V Nguyen**  
**Primary Examiner**  
**Art Unit 2851**

hvn  
10/19/07